Missouri Department of Natural Resources
Air Pollution Control Program

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2005-09-092

Continental Cement Company, L.L.C.

14755 N. Outer Forty Drive, Suite 514, Chesterfield, MO 63017

Continental Cement Company, L.L.C.

10107 Highway 79 South, Hannibal, MO 63401

Ralls County, S2, T56N, R4W

Installation of a 3,300 ton of clinker per day preheater/precalciner Portland cement kiln, underground limestone mine, and associated processes. This review was conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Continental Cement Company, L.L.C.
Ralls County, S2, T56N, R4W

1. Superseding Condition
   The conditions of this permit supersede all special conditions found in the previously issued construction permits (Permit Numbers 032005-024 and 092002-022) from the Air Pollution Control Program.

2. Shut Down of Existing Emission Units and Operations at Installation
   A. Continental Cement Company, L.L.C. shall render inoperable by removing the starters, motors or drive devices of the equipment listed below before the date all shake down related activities for the new preheater/precalciner (PH/PC) kiln system (KP-8) have been completed and the new kiln system becomes fully operational. However, in no instance, may this shake down period for the new kiln system exceed 180 days from the initial start-up date of the new kiln system. The emission units and operations listed below may not be operated after the new kiln system becomes fully operational without first undergoing New Source Review from the Air Pollution Control Program.

No.	Unit ID	Emission Unit Description
1.	CG-01B	Barge unloading (clinker)
2.	CG-04	Coal storage pile (rail)
3.	CG-07	Gypsum stockpile – stockhouse 5
4.	CG-9A	Coal unloading at rail hopper
5.	CG-09B	Gypsum unloading at hopper – natural
6.	CG-09D	Truck gypsum unloading at hopper
7.	CG-9G, 10	Coal transfer rail
8.	CG-11	Coal transfer rail – elevator to truck
9.	CG-12, 12A	Coal transfer – elevator to coal conveyors MBE-1/MBC-3/MBC-4
10.	CG-13	Coal transfer – MBC-4 to coal silo
11.	CG-14-14D	Conveyors to gypsum bins
12.	CG-16	Gypsum transfer
13.	SG-3	Indoor synthetic gypsum storage pile
14.	SG-5	Loading synthetic gypsum to hopper
15.	SG-12	Reclaim hopper loading

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

16.	RM-01	Quarry drilling - limestone
17.	RM-02	Quarry blasting - limestone
18.	RM-03	Quarry loading trucks - limestone
19.	RM-06	Clay storage pile in stockhouse 5
20.	RM-11	Limestone reclaim hopper
21.	RM-12	Belt conveyor to silos – raw material conveyor
22.	RM-13	Crushed raw material storage pile
23.	RM-13A	Crushed raw material conveyor transfer
24.	RM-15	Secondary crusher – limestone
25.	RM-16	Transfer point limestone
26.	RM-17	Raw material grinding and drying
27.	RM-18	Secondary crusher – clay
28.	RM-19	Transfer point clay
29.	KP-01, 01A	Cement kiln, cement kiln auxiliary fuel
30.	KP-02A	Endloader transfer
31.	CM-01	Clinker cooler
32.	CM-01A	Clinker discharge via screw conveyor
33.	CM-02	Clinker transfer drag to belt conveyor
34.	CM-02A	Clinker discharge to apron pan
35.	CM-10B	Finish mills #1 and #2 cement coolers
36.	SH-06	Cement handling – bag packing

B. Continental Cement Company, L.L.C. shall notify the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 15 days after the following events occur:
   1) The date of initial start-up of the new PH/PC kiln system (KP-8),
   2) The date the shake down period ends and the new kiln system becomes fully operational or 180 days after initial start-up of the new kiln system, whichever is sooner, and
   3) The date each unit listed in Special Condition Number 2.A is rendered inoperable.

3. Cessation of Transport of Materials on Existing Haul Roads

A. Continental Cement Company, L.L.C. shall cease transport of the stated material on the haul roads listed below before the date all shake down related activities for the new PH/PC kiln system (KP-8) have been completed and the new kiln system becomes fully operational. However, in no instance, may this shake down period for the new kiln system exceed 180 days from the initial start-up date of the new kiln system. The haul roads listed below may not be used to transport the listed materials after the new kiln system becomes fully operational without first undergoing New Source Review from the Air Pollution Control Program.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

No.	Unit ID	Emission Unit Description
1.	CG-03A	Unpaved haul road – clinker from stone entrance to stockhouse 5
2.	CG-03B	Paved haul road – clinker from stone entrance to stockhouse 5
3.	CG-03C	Unpaved haul road – clinker truck to hopper
4.	CG-03D	Unpaved haul road – coal to stockhouse 5
5.	CG-03E	Paved haul road – coal to stockhouse 5
6.	CG-05	Unpaved haul road – coal from stockpile to hopper
7.	CG-06A	Unpaved haul road – gypsum from stone entrance to stockhouse 5
8.	CG-06B	Paved haul road – gypsum from stone entrance to stockhouse 5
9.	CG-08	Unpaved haul road – gypsum from stockhouse 5 to hopper
10.	CG-20	Haul road unpaved – outdoor syn gyp storage pile to syngyp building
11.	RM-04A	Haul road – quarry to primary crusher - limestone
12.	RM-04B	Haul road – quarry to primary crusher - limestone
13.	RM-05A	Haul road – plant entrance to stockhouse 5 (clay)
14.	RM-05B	Haul road – plant entrance to stockhouse 5 (clay)
15.	RM-07	Haul road – clay from stockhouse 5

B. Continental Cement Company, L.L.C. shall notify the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 15 days after the following events occur:
   1) The date of initial start-up of the new PH/PC kiln system (KP-8),
   2) The date the shake down period ends and the new kiln system becomes fully operational or 180 days after initial start-up of the new kiln system, whichever is sooner, and
   3) The date each haul road listed in Special Condition Number 3.A ceases to transport the material listed.

4. Restriction on the Maximum Amount of Clinker Production Allowed From the New PH/PC Kiln System

   A. Continental Cement Company, L.L.C. shall not produce over 3,300 tons of clinker from the new kiln system (KP-8) per day.

   B. Continental Cement Company, L.L.C. shall maintain an accurate record of clinker production from the new kiln system (KP-8). The installation shall record the daily total of clinker production from this emission unit.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

5. Restriction of Operations at Continental Cement Company, L.L.C.

A. Continental Cement Company, L.L.C. shall not process/handle more than 465 tons per day of clay in any piece of equipment from hauling into the plant through load-in to the clay storage piles (RM-20A, RM-20B, RM-21 and RM-22).

B. Continental Cement Company, L.L.C. shall not process/handle more than 3,600 tons per day of clay in any piece of equipment from load-out from the clay storage piles to the primary raw materials crusher (RM-21, RM-22 and RM-23).

C. Continental Cement Company, L.L.C. shall not process/handle more than 3,600 tons per day of shale from truck loading through hauling to the primary raw materials crusher (RM-29 and RM-30).

D. Continental Cement Company, L.L.C. shall not process/handle a combined total of shale and clay more than 3,600 tons per day from the truck unloading at the primary raw materials primary crusher through load out from the raw materials storage building (RM-8, RM-9, RM-10.1, RM-10.2, RM-31, RM-25, RM-26 and RM-27).

E. Continental Cement Company, L.L.C. shall not process/handle more than 150 tons per day of iron ore from hauling into plant through load-out from the raw material storage building (RM-24, RM-25, RM-26 and RM-27).

F. Under no circumstances may Continental Cement Company, L.L.C. store ash, or any other clay substitute, in the outdoor clay storage pile (RM-22).

G. Continental Cement Company, L.L.C. shall not process/handle more than 6,500 tons per day of limestone from hauling from offsite through load-in at the limestone dome (LS-1, LS-3 and LS-5).

H. Continental Cement Company, L.L.C. shall not haul more than a combined total of 250 tons per day of gypsum (synthetic or natural) on the haul roads (CG-18) and (SG-11) in and out of the plant.

I. Continental Cement Company, L.L.C. shall not process/handle more than a combined total of coal and pet coke more than 600 tons per day from barge/rail unloading or truck hauling from offsite to the coal/coke storage pile (CG-1A, CG-1B, CG-2A, CG-2B and CG-17).

J. Continental Cement Company, L.L.C. shall not haul (SF-33/34 **or** SF-

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

36/37) more than 300 tons per day of supplemental fuels into the plant.

K. Continental Cement Company, L.L.C. shall not haul (SF-53) more than 200 tons per day of waste fuel from fuel prep to solid waste storage.

L. Continental Cement Company, L.L.C. shall not load more than 100 tons per day of cement kiln dust into trucks per day (KP-3).

M. Continental Cement Company, L.L.C. shall not load more than the following listed amounts of cement on a daily basis:
1) Bulk Railcar Loading (SH-5) – 7,200 tons of cement per day,
2) River Cement Silos (SH-7) – 12,000 tons of cement per day,
3) Barge Loading (SH-8, SH-9) – 30,000 tons of cement per day, combined, and
4) Bulk Truck Loading (SH-4) – 3,500 tons of cement per day.

N. Continental Cement Company, L.L.C. shall maintain an accurate record of raw materials handling, limestone handling, fuel handling, gypsum handling, cement kiln dust handling and cement loadout. The installation shall record the daily total of the materials processed in order to verify compliance with the limits established above.

6. Restriction of Operations at Saverton Quarry

A. Continental Cement Company, L.L.C. shall not process more than 8,000 tons of limestone per day in any piece of equipment from unloading at hopper to the limestone surge pile (EP-4, EP-5, EP-6, EP-5A, EP-6A, EP-9 and EP-30).

B. Continental Cement Company, L.L.C. shall not process more than 6,500 tons of limestone per day in any piece of equipment from conveying (EP-7A and EP-7B), truck loading (EP-8) and hauling off-site (EP-21) per day.

C. Continental Cement Company, L.L.C. shall operate the Saverton Quarry only between the hours of 6:00 a.m. and 11:00 p.m.

D. Continental Cement Company, L.L.C. shall maintain an accurate record of crushed limestone production and limestone conveyed from the Saverton Quarry and the hours of operation of the plant.

7. Allowed Equipment at Saverton Quarry

Continental Cement Company, L.L.C. may only operate the equipment listed below at the Saverton Quarry. Additional pieces of equipment at the Saverton

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The permittee is authorized to construct and operate subject to the following special conditions:

Quarry may not be operated after the new PH/PC kiln system becomes fully operational without first undergoing New Source Review from the Air Pollution Control Program.

No.	Unit ID	Emission Unit Description
1.	EP-1	Quarry – drilling
2.	EP-2	Quarry – blasting
3.	EP-3	Quarry – truck loading
4.	EP-4	Unloading at hopper
5.	EP-5	Conveyor screening
6.	EP-5A	Conveyor screening 2
7.	EP-6	Crusher
8.	EP-6A	Crusher 2
9.	EP-7	Conveyor Transfer to bins (2)
10.	EP-8	Bin loadout to truck
11.	EP-20	Unpaved haul road – quarry to crusher
12.	EP-21	Paved haul road
13.	EP-30	Limestone stockpile

8. Allowable Fuels for PH/PC Kiln System

A. Continental Cement Company, L.L.C. shall combust only the following fuels only in the new PH/PC kiln system:

1) Coal
2) Petroleum coke
3) Solid hazardous waste derived fuel (SHWDF)
4) Liquid hazardous waste derived fuel (LHWDF)
5) Natural gas (start-up/malfunction only)
6) Synthetic gas
7) Alternative non-hazardous waste fuels, including chipped tires, shredded plastics, plastic-backed paper, autoplant sludge, automobile fluff, wastewater sludges, industrial resins, furniture manufacturing sawdust and wood waste, plastic and starch abrasives, shredded shingles, wood waste, tank bottoms, spent carbon, off-spec industrial products, mixed industrial debris and other residential residues

B. Continental Cement Company, L.L.C. shall not exceed the following limits when utilizing any of the alternative non-hazardous waste fuels listed in Special Condition Number 8.A.7:

1) Mercury in excess of 120 micrograms per dry standard cubic meter (µg/dscm) corrected to 7 percent oxygen;
2) Lead and cadmium in excess of 180 µg/dscm, combined emissions, corrected to 7 percent oxygen; and

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3) Arsenic, beryllium and chromium in excess of 54 µg/dscm, combined emissions, corrected to 7 percent oxygen.

9. Haul Road and Stockpile Controls at Saverton Quarry: non-Best Available Control Technology (non-BACT Controls)

A. Continental Cement Company, L.L.C. shall control the emissions of particulate matter less than ten microns in diameter (PM_{10}) from the unpaved quarry haul road (EP-20) and vehicular traffic areas of the stockpile (EP-30) so as to achieve 90% control of PM_{10} by **either** documented watering or the application of chemical dust suppressant.

1) Chemical Dust Suppressant

a) The suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) shall be applied in accordance with the manufacturer's suggested application rate and re-applied as necessary to achieve control of fugitive emissions from these areas.

b) Continental Cement Company, L.L.C. shall keep records of the time, date, and the amount of material applied for each application of chemical dust suppressant agent on these areas.

2) Documented Watering

a) Water shall be applied in accordance with a recommended application rate of 100 gallons per day per 1,000 square feet of unpaved/untreated surface area of haul roads/vehicle activity areas as necessary to achieve control of fugitive emissions from these areas.

b) Continental Cement Company, L.L.C. shall maintain a log that documents daily water applications. This log shall include, but is not limited to, date and volumes (e.g., number of tanker applications and/or total gallons used) of water application. The log shall also record rationale for not applying water on days the areas are in use (e.g., meteorological situations, precipitation events, freezing, etc.).

c) Meteorological precipitation of any kind, (e.g. a quarter inch or more rainfall, sleet, snow, and/or freeze thaw conditions) which is sufficient in the amount or condition to achieve control of fugitive emissions from these areas while the areas are in use, may be substituted for water application until such time as conditions warrant application of water.

d) Watering may also be suspended when the ground is frozen, during periods of freezing conditions when watering

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would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads. Continental Cement Company, L.L.C. shall record a brief description of such events in the same log that documents the watering.

B. Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the paved haul road so as to achieve 95% control of PM_{10} by periodically washing its surface.
   1) Maintenance and/or repair of the surfaces will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.
   2) Operators shall periodically water and wash all of the paved portions of the haul road as necessary to achieve control of fugitive emissions from these areas while the plant is operating.

10. Haul Road and Stockpile Controls at Continental Cement Company (non-BACT controls)
   A. Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the vehicular traffic areas of the clay storage cave stockpile (RM-21), stockhouse #5 (CM-5) and outside clinker storage pile (CM-15), and the unpaved clay haul road (RM-23) and the unpaved clinker haul road (CM-14) so as to achieve 90% control of PM_{10} by **either** documented watering or the application of chemical dust suppressant.
      1) Chemical Dust Suppressant
         a) The suppressant (such as magnesium chloride, calcium chloride, lignosulfonates, etc.) shall be applied in accordance with the manufacturer's suggested application rate and re-applied as necessary to achieve control of fugitive emissions from these areas.
         b) Continental Cement Company, L.L.C. shall keep records of the time, date, and the amount of material applied for each application of chemical dust suppressant agent on these areas.
      2) Documented Watering
         a) Water shall be applied in accordance with a recommended application rate of 100 gallons per day per 1,000 square feet of unpaved/untreated surface area of haul roads/vehicle activity areas as necessary to achieve control of fugitive emissions from these areas.
         b) Continental Cement Company, L.L.C. shall maintain a log that documents daily water applications. This log shall

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

include, but is not limited to, date and volumes (e.g., number of tanker applications and/or total gallons used) of water application. The log shall also record rationale for not applying water on days the areas are in use (e.g., meteorological situations, precipitation events, freezing, etc.).

c) Meteorological precipitation of any kind, (e.g. a quarter inch or more rainfall, sleet, snow, and/or freeze thaw conditions) which is sufficient in the amount or condition to achieve control of fugitive emissions from these areas while the areas are in use, may be substituted for water application until such time as conditions warrant application of water.

d) Watering may also be suspended when the ground is frozen, during periods of freezing conditions when watering would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads. Continental Cement Company, L.L.C. shall record a brief description of such events in the same log that documents the watering.

B. Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the paved iron ore haul road (RM-24) so as to achieve 95% control of PM_{10} by periodically washing its surface.

1) Maintenance and/or repair of the surfaces will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.

2) Operators shall periodically water and wash all of the paved portions of the haul road as necessary to achieve control of fugitive emissions from these areas while the plant is operating.

11. Control of PM_{10} Emissions (non-BACT controls)

A. Crusher Building

1) Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the crusher building by holding the building under negative pressure and venting the primary crusher (RM-9) and two transfer points (RM-10.1, 10.2) to baghouse (LDC-4). The buildings shall be equipped with gauges, which indicate the pressure in the buildings. These gauges shall be located such that the Department of Natural Resources' employees may easily observe them.

2) Continental Cement Company, L.L.C. shall monitor and record the pressure at least once in every 24-hour period, while crushing equipment is in operation.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

B. Stockhouse #5
Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the clinker storage pile in stockhouse #5 (CM-5) by
1) Placing siding over the existing window openings that exist in the building. This siding must completely cover all window openings and must be in place prior to start-up of the new PH/PC kiln system.
2) Installing and utilizing a misting system. The misting system must operate at all times that loadin/loadout take place so as to achieve 90% control of PM_{10}.
3) Placing a door on the entrance to the building. This door shall remain closed at all times that the misting system is not operating.

C. Clay Storage Piles
Continental Cement Company, L.L.C. shall not process clay in the clay storage cave (RM-21) and the outdoor clay storage pile (RM-22) concurrently. Continental Cement Company, L.L.C. shall maintain an accurate record of clay handling. The installation shall record the time of day and the pile from which clay is loaded/unloaded in order to verify compliance with the limit established above.

12. Control of Nitrogen Oxides (NO_x) Emissions (non-BACT controls)
A. Continental Cement Company, L.L.C. shall control the emissions of NO_X from the coal mill preheater (CG-25) by installing a low-NO_X burner.

B. Continental Cement Company, L.L.C. shall control the emissions of NO_X from the new PH/PC kiln system (KP-08) by installing a multi-stage preheater and a low-NO_X calciner.

C. The low-NO_X burners must be in use at all times when the associated pieces of equipment are in operation, and shall be operated and maintained in accordance with the manufacturer's specifications.

13. Standards of Performance for Best Available Control Technology (BACT) for PM_{10}
A. Shale Quarry Haul Road Requirement – Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the unpaved shale quarry haul road (RM-30) so as to achieve 90% control of PM_{10} by **either** documented watering or the application of chemical dust suppressant.
1) Chemical Dust Suppressant
a) The suppressant (such as magnesium chloride, calcium

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

chloride, lignosulfonates, etc.) shall be applied in accordance with the manufacturer's suggested application rate and re-applied as necessary to achieve control of fugitive emissions from these areas.

b) Continental Cement Company, L.L.C. shall keep records of the time, date, and the amount of material applied for each application of chemical dust suppressant agent on these areas.

2) Documented Watering

a) Water shall be applied in accordance with a recommended application rate of 100 gallons per day per 1,000 square feet of unpaved/untreated surface area of haul roads as necessary to achieve control of fugitive emissions from these areas.

b) Continental Cement Company, L.L.C. shall maintain a log that documents daily water applications. This log shall include, but is not limited to, date and volumes (e.g., number of tanker applications and/or total gallons used) of water application. The log shall also record rationale for not applying water on days the areas are in use (e.g., meteorological situations, precipitation events, freezing, etc.).

c) Meteorological precipitation of any kind, (e.g. a quarter inch or more rainfall, sleet, snow, and/or freeze thaw conditions) which is sufficient in the amount or condition to achieve control of fugitive emissions from these areas while the areas are in use, may be substituted for water application until such time as conditions warrant application of water.

d) Watering may also be suspended when the ground is frozen, during periods of freezing conditions when watering would be inadvisable for traffic safety reasons, or when there will be no traffic on the roads. Continental Cement Company, L.L.C. shall record a brief description of such events in the same log that documents the watering.

B. Temporary Limestone Haul Road Requirement - Continental Cement Company, L.L.C. shall control the emissions of PM_{10} from the temporary limestone haul road (LS-1) so as to achieve 95% control of PM_{10} by paving the road and periodically washing its surface.

1) Continental Cement Company, L.L.C. shall pave the temporary limestone haul road with materials such as asphalt, concrete, and/or other materials. The pavement will be applied in

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

accordance with industry standards. The paving shall be completed prior to the startup of the new PH/PC kiln system.

2) Maintenance and/or repair of the surfaces will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.

3) Operators shall periodically water and wash all of the paved portions of the haul road as necessary to achieve control of fugitive emissions from these areas while the plant is operating.

C. Storage Pile Requirements

1) SHWDF Storage Pile Requirement

a) The Kiln Burner Building (BB-1) that houses the SHWDF storage pile (SF-61) shall be held under negative pressure and vented by the secondary air fan at the clinker cooler to the kiln. This fan shall be equipped with a monitor, which shall monitor the vacuum on the fan. The monitor shall be located such that Department of Natural Resources' employees may easily observe them.

b) Continental Cement Company, L.L.C. shall cease operations at the BB-1 Building should negative pressure no longer exist at the fan. Operations at the BB-1 Building may resume upon restoration of negative pressure.

2) Raw Materials Storage Piles and Limestone Dome Requirements

a) The Raw Materials Storage Building (RM-25, RM26, RM-27) and the Limestone Dome (LS-5) shall be held under negative pressure and vented to baghouses. The buildings shall be equipped with gauges, which indicate the pressure in the buildings. These gauges shall be located such that Department of Natural Resources' employees may easily observe them.

b) Continental Cement Company, L.L.C. shall monitor and record the pressure at least once in every 24-hour period, while loading/unloading equipment is in operation.

D. Point Sources Requirement – Continental Cement Company, L.L.C. shall enclose and vent each PM_{10} point source listed in Table A.1, *Point Source Baghouse Control Devices*, using baghouses. The enclosure of the emissions units shall be constructed and maintained such that no visible emissions [zero percent (0%) opacity from the enclosure] are allowed to occur from these sources except through the gases exiting from the baghouses.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

1) Continental Cement Company, L.L.C. shall not emit more than 0.007 grains per dry standard cubic foot (gr/dscf) of filterable PM_{10} from any baghouse except the main stack baghouses (316BF1 and 326BF1) and the clinker cooler stack baghouse (356BF1).
2) Continental Cement Company, L.L.C. shall not emit more than 0.01 gr/dscf of filterable PM_{10} from the clinker cooler stack baghouse (356BF1).
3) Continental Cement Company, L.L.C. shall not emit more than 0.0069 gr/dscf of total PM_{10} from the main stack baghouses (316BF1 and 326BF1).
4) Compliance Testing for Grain Loading
   a) Continental Cement Company, L.L.C. shall test each of the following baghouses subject to this emission limitation for initial compliance demonstration.
      (i) Main Stack – cement kiln (316BF1 and 326BF1)
      (ii) Clinker cooler stack (356BF1)
      (iii) Finish mill air separator (546BF1)
   b) Continental Cement Company, L.L.C. shall test ten percent by group (listed below) of the baghouses (not specifically listed above) subject to this emission limitation for initial compliance demonstration.
      (i) Group 1 – All units with flow rates less than 2000 standard cubic feet per minute (scfm),
      (ii) Group 2 – All units with flow rates equal to or exceeding 2000 scfm but less than or equal to 5000 scfm
      (iii) Group 3 – All units with flow rates exceeding 5000 scfm
5) Continental Cement Company, L.L.C. shall not emit more than 0.516 pounds of total PM_{10} per ton of clinker from the new PH/PC kiln system (stack ID number 318SK1). This limit is for total PM_{10}, consisting of both condensable and filterable fractions. The installation shall demonstrate compliance with this limit through annual compliance demonstration, consisting of three 1-hour runs.

E. Emergency Generator

Continental Cement Company, L.L.C. shall not emit more than 0.33 pounds of total PM_{10} per hour of operation from the emergency generator (MS-7) in order to meet BACT. The installation shall demonstrate compliance with this limit through initial compliance demonstration, consisting of three 1-hour runs.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

14. Standards of Performance for BACT for Sulfur Oxides (SO_x)
    A. Kiln/Coal Mill Preheater
        1) Continental Cement Company, L.L.C. shall control the emissions of SO_2 from the new PH/PC kiln system (KP-08) by installing lime spray drying systems on the alkali bypass stream and on the stream that normally vents to the raw mill, when the raw mill is not in operation (raw mill bypass stream) in order to meet BACT.
            a) The lime spray dryer on the alkali bypass line must be in use at all times when kiln exhaust is routed to the alkali bypass line.
            b) The raw mill bypass lime spray dryer must be in use at all times that the raw mill is <u>not</u> in operation.
        2) The lime spray dryers shall be operated and maintained in accordance with the manufacturer's specifications.
        3) Continental Cement Company, L.L.C. shall not emit more than 1.93 pounds of SO_2 per ton of clinker from main stack (stack ID number 318SK1) based on a 30-day rolling average.
        4) Continental Cement Company, L.L.C. shall not emit more than 265.38 pounds of SO_2 per hour of operation from the main stack based on a 30-day rolling average.
        5) Continental Cement Company, L.L.C. shall operate continuous SO_2 emission monitors to measure, record and report SO_2 emissions compliance.

    B. Emergency Generator Control
    Continental Cement Company, L.L.C. shall not emit more than 0.01 pounds of SO_x per hour of operation from the emergency generator (MS-7) in order to meet BACT. The installation shall demonstrate compliance with this limit through initial compliance demonstration, consisting of three 1-hour runs.

15. Standards of Performance for BACT for Volatile Organic Compounds (VOC) and Carbon Monoxide (CO)
    A. Kiln/Coal Mill Preheater
        1) Continental Cement Company, L.L.C. shall use good combustion practices at all times for the new PH/PC kiln system (KP-8) and the coal mill preheater (CG-25) in order to meet BACT.
        2) Continental Cement Company, L.L.C. shall not emit more than 0.12 pounds of VOC per ton of clinker produced from the main stack based on a 30-day rolling average.
        3) Continental Cement Company, L.L.C. shall not emit more than 3.6 pounds of CO per ton of clinker produced from the main stack

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

based on a 30-day rolling average.

4) Continental Cement Company, L.L.C. shall operate continuous CO emission monitors to measure, record and report CO emissions compliance.

B. Emergency Generator

1) Continental Cement Company, L.L.C. shall not emit more than 2.08 pounds of CO per hour of operation from the emergency generator (MS-7) in order to meet BACT. The installation shall demonstrate compliance with this limit through initial compliance demonstration, consisting of three 1-hour runs.

2) Continental Cement Company, L.L.C. shall develop an Operating and Maintenance Manual for the emergency generator (MS-7) based on manufacturer's specifications and recommendations for unit operation to ensure that good combustion practice of ultra low sulfur diesel fuel occurs as a routine operating practice. This manual shall be finalized prior to commencement of operation of the generator.

a) System operators shall be provided training on those procedures prior to operation of the generator.

b) A written record will be maintained detailing the names of employees, date of the initial training, and dates of subsequent review of the good combustion practice procedures.

C. LHWDF Storage Tanks

Continental Cement Company, L.L.C. shall vent all vapors emanating from the LHWDF tanks (SF-3C and SF-3D) to a carbon adsorption bed.

16. PH/PC Kiln System Operating Conditions

Continental Cement Company, L.L.C. shall maintain a sulfur-to-alkali ratio in the kiln between 0.8 and 1.2. The installation shall keep a log containing test results of the ratio on a daily basis for compliance.

17. Emergency Generator Operating Conditions

A. Continental Cement Company, L.L.C. shall operate the emergency generator (MS-7) only in the event of interruption of electric power from the local utility and for short periods of time to perform maintenance and operational readiness testing.

B. Continental Cement Company, L.L.C. shall not operate the emergency generator for more than 500 hours annually. The generator shall be

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

equipped with a non-resettable meter to record the annual hours of operation for compliance.

C. The sulfur content of the diesel fuel combusted in the emergency generator at the installation shall not exceed 15 parts per million by weight (ppmw). Continental Cement Company, L.L.C. shall obtain and record, for each fuel oil delivery from the fuel vendors the sulfur content for the diesel fuel. The installation also has the option to conduct their own fuel analysis.

18. Baghouse Operating Conditions

A. The baghouses specified in Table A.1, *Point Source Baghouse Control Devices,* must be in use at all times when that associated piece of equipment is in operation, and shall be operated and maintained in accordance with the manufacturer's specifications. These baghouses shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.

B. Continental Cement Company, L.L.C. shall monitor and record the operating pressure drop across the baghouses at least once in every 24-hour period when the associated equipment is in operation.

C. Appropriate replacement filters for each baghouse shall be kept on hand at all times. These replacement filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

D. Continental Cement Company, L.L.C. shall maintain an operating and maintenance log for each baghouse specified in Table A.1, *Point Source Baghouse Control Devices* which shall include the following:

1) Incidents of malfunction including the dates and duration of the event, the probable cause, any corrective actions taken and the impact on emissions due to the malfunction,
2) Any maintenance activities conducted on the unit, such as parts replacement, replacement of equipment, etc., and
3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

19. Conditions Resulting from Ambient Air Quality Analysis

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

A. Continental Cement Company, L.L.C. shall not emit more than 71 pounds of total PM_{10} per hour from the main stack. This limit is for total PM_{10}, consisting of both condensable and filterable fractions. The installation shall demonstrate compliance with this limit through annual compliance demonstration, consisting of three 1-hour runs.

B. Continental Cement Company, L.L.C. shall not emit more than 550 pounds of SO_2 per hour from the main stack based on a 3-hour rolling average. The installation shall demonstrate compliance with this condition using the SO_2 monitoring system established in Special Condition Number 13.A.6).

C. Continental Cement Company, L.L.C. shall not emit more than 265 pounds of SO_2 per hour from the main stack based on a 24-hour rolling average. The installation shall demonstrate compliance with this condition using the SO_2 monitoring system established in Special Condition Number 13.A.6).

D. Continental Cement Company, L.L.C. shall not emit more than 495 pounds of CO per hour, based on a 1-hour rolling average. The installation shall demonstrate compliance with this condition using the CO monitoring system established in Special Condition Number 14.A.5.

20. Continuous Emission Monitoring System (CEMS) – PH/PC Kiln System

A. Continental Cement Company, L.L.C. shall install, certify, operate, calibrate, test and maintain CEMS for SO_2 and CO and any necessary auxiliary monitoring equipment in accordance with all applicable regulations. If there are conflicting regulatory requirements, the more stringent shall apply.

B. Continental Cement Company, L.L.C. shall install and operate a data acquisition and handling system to calculate emissions in terms of the emission limitations specified in this permit.

C. Compliance with the SO_2 and CO emission limits for the new PH/PC kiln system shall be demonstrated through the use of the required CEMS.

21. Stack Testing Requirements – New PH/PC Kiln System

A. Continental Cement Company, L.L.C. shall conduct performance testing on the new PH/PC kiln system's (KP-8) main stack sufficient to quantify the emission rates of filterable and condensable PM_{10}, SO_x, NO_x, VOC and CO from this source. These tests shall be done in accordance with

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

the procedures outlined below.

B. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date of any such performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must include specification of test methods to be used and be approved by the Director prior to conducting the above required emissions testing.

C. Within 60 days of achieving the maximum production rate of the new PH/PC kiln system, and in any case, no later than 180 days after initial start-up, the owner/operator shall have conducted the required performance tests. If one or more of the above air pollutants for which testing is required by Special Condition Number 20.A is also required to be tested to demonstrate compliance with another applicable rule (such as 40 CFR Part 63 Subpart LLL, National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry), then Continental Cement Company, L.L.C. may conduct the performance testing according to the time frames indicated by the applicable regulation.

D. Any required performance testing shall be conducted during periods of representative conditions and should also be conducted at the maximum process/production rates or within ten percent (10%) of this rated capacity, not to include periods of start-up, shutdown, or malfunction. However, if a new performance testing is conducted at a production rate which is less than 90% of the maximum rated capacity of the equipment, then ten percent (10%) above the production rate at which the performance test was conducted shall become the new maximum allowable hourly production rate for the unit.

E. Two (2) copies of a written report of the performance test results must be submitted to the Director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required Environmental Protection Agency (EPA) Method for at least one (1) sample run for each air pollutant tested.

F. No later than thirty (30) days after the performance test results are submitted, Continental Cement Company, L.L.C. shall provide the Director with a report that establishes the potential emissions of each air pollutant

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

tested in Special Condition Number 20.A. This report shall report the potential emission rates in pounds per hour, tons per year and pounds per ton of clinker produced from the new PH/PC kiln system (KP-8) in order that the Air Pollution Control Program may verify the potential emissions from this project.

G. If the results of the performance testing shows that the emission rates for NO_X are greater than those used in the emissions analysis herein, then Continental Cement Company, L.L.C. shall evaluate what effects these higher emission rates would have had on the permit applicability of this project. Continental Cement Company, L.L.C. shall submit the results of any such evaluation in a timely manner for Air Pollution Control Program review and approval.

H. The above time frames associated with this performance testing condition may be extended upon request of Continental Cement Company, L.L.C. and approval by the Director.

22. Restriction of Public Access – Fencing or Physical Barrier to Restrict Public Access to Property
Continental Cement Company, L.L.C. shall preclude public access to property that is considered within the non-ambient air zone with respect to the air quality impact analysis conducted for this permit. Installation and maintenance of a fence or other physical barrier shall be the means to preclude public access. A map showing property boundary (precluded areas) can be found in Appendix B, Figure 4 entitled "Continental Cement Hannibal, Missouri-Property Boundary" of the Ambient Air Quality Impact Analysis modeling memo. Continental Cement Company, L.L.C. shall complete construction of the physical barrier to prior to commencing operation of the new PH/PC kiln system.

23. Record Retention Requirements
Continental Cement Company, L.L.C. shall maintain all records required by this permit, on-site, for the most recent 60 months of operation and shall make such records available immediately to any Missouri Department of Natural Resources' personnel upon request.

24. Notification Requirement
Continental Cement Company, L.L.C. shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, Missouri 65102, no later than ten (10) days after the end of the month during which the records required by this permit indicate that the source exceeds the limitations established in the Special Conditions above.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (8) REVIEW
Project Number: 2005-09-092
Installation ID Number: 173-0001
Permit Number:

Continental Cement Company, L.L.C. Complete: January 24, 2006
10107 Highway 79 South
Hannibal, MO 63401

Parent Company:
Continental Cement Company, L.L.C.
14755 N. Outer Forty Drive, Suite 514
Chesterfield, MO 63017

Ralls County, S2, T56N, R4W

REVIEW SUMMARY

- Continental Cement Company, L.L.C. (Continental) has applied for authority to construct a 3,300 ton of clinker per day preheater/precalciner (PH/PC) Portland cement kiln, underground limestone mine, and associated processes.

- Hazardous Air Pollutant (HAP) emissions are expected from the increase in clinker production levels. HAPs of concern from the cement manufacturing processes are hydrogen chloride, fluorides, and compounds of lead, beryllium, mercury, arsenic and selenium. However, the HAP emitting units at the installation are governed by the requirements of a Maximum Achievable Control Technology (MACT) standard; therefore a Missouri Section (9) review is not required.

- Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, of the New Source Performance Standards (NSPS) applies to some of the proposed equipment. Subpart Y, *Standards of Performance for Coal Preparation Plants*, applies to some of the coal handling equipment.

- The MACT standard, 40 CFR Part 63, Subpart LLL, *National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry*, Subpart XX, *National Emission Standards for Ethylene Manufacturing Process Units: Heat Exchange Systems and Waste Operations* and Subpart EEE, *National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors,* apply to some of the proposed equipment.

- Subpart FF of the National Emission Standards for Hazardous Air Pollutants (NESHAPs), *NESHAPs for Benzene Waste Operations,* applies to this installation.

- The control technologies associated with Best Available Control Technology (BACT) for this project were determined to be:

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- PM_{10}: baghouses for point source PM_{10} emissions; enclosures, paving and water spray for fugitive source PM_{10} emissions;
- SO_x: a lime spray drying (LSD) system on the alkali bypass exhaust; inherent dry scrubbing when the raw mill is operating; a raw mill bypass LSD system when the raw mills are not in operation; and
- CO and VOC: good combustion practices.

- Continental is an existing major source for criteria pollutants. The potential emissions for this project were calculated to be above the major source level for PM_{10} [15.0 tons per year (tpy)], SO_x (40.0 tpy), CO (100.0 tpy) and VOC (40 tpy). Potential emissions of beryllium exceed Missouri's de minimis threshold (0.0004 tpy). Beryllium was removed from the list of currently regulated pollutants subject to Federal PSD review as of December 31, 2002 (Federal Register, Part III, EPA 40 CFR Parts 51 and 52, *PSD and NSR; Final Rule and Proposed Rule*). The potential emissions of lead, mercury and fluorides were calculated to be below their respective significance levels. Therefore, this review was conducted in accordance with Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM_{10}, SO_x, VOC and CO from the project are above de minimis levels.

- A net emissions increase analysis was submitted for nitrogen oxides (NO_x) emissions in which the company proposed to remove one (1) existing wet process rotary clinker kiln at the installation. This net emissions increase analysis demonstrated that this project would not exceed the significant threshold associated with major review for NO_x.

- This installation is located in Ralls County, an attainment area for all criteria air pollutants.

- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2, Number 3, *Portland Cement Plants*].

- Air quality modeling for this project was performed to determine the ambient impact of those pollutants that will be emitted in significant amounts (PM_{10}, SO_2 and CO). Based upon the model reviewed by the Air Pollution Control Program staff, the study submitted by Continental is complete and demonstrates that Continental will not contribute to any violation of the National Ambient Air Quality Standards (NAAQS) or available increment.

- Emissions testing is required for several pieces of the new equipment subject to a NSPS, BACT or MACT standard. Several pieces of existing equipment will need to be retested due to increased utilization of the equipment. Testing is also required for the new PH/PC kiln system, to quantify emission rates of PM_{10}, SO_x, NO_x, CO and VOC.

- Revision to the Part 70 Operating Permit is required for this installation within 1 year of equipment startup.

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- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Continental Cement Company, L.L.C. (Continental) operates a wet process rotary cement kiln on a 3,100-acre site three miles south of the city of Hannibal in Ralls County. Clinker production averages 620,000 tons annually. The plant operates as a hazardous waste combustor while producing Portland cement. In addition to the new PH/PC kiln system, the installation operates a syngyp process (synthetic gypsum mixed with cement kiln dust) and has an ongoing artificial soils project to support the production of trees as a renewable alternative fuel source.

The existing installation is considered to be a major source of air emissions by both the Construction and Operating Permit units. Continental obtained a Part 70 operating permit on April 8, 2005 (Permit No. OP2005-009). The following construction permits have been issued to Continental from the Air Pollution Control Program.

Table 1: Previously Issued Construction Permits

Permit Number	Description
0686-002	A Section (5) permit issued on October 7, 1986, for a new waste fuels storage facility
1086-004	A Section (5) permit issued on December 24, 1986, to add the capability to burn waste fuel in the kiln
1086-004A	An amendment to Permit No. 1086-004 issued on February 15, 1990 for the use of a substitute raw material
1086-004B	An amendment to Permit No. 1086-004 to alter a beryllium emission limit
0890-008	A Section (5) permit issued on August 21, 1990, for the addition of 2 new 75,000 gallon above ground tanks for liquid fuel storage and 1 200 ton capacity dry fuel storage tank and 1 50 ton capacity dry fuel surge tank
1086-004C	An amendment to Permit No. 1086-004A issued on June 11, 1996, to allow the installation to accept and burn 5,000 BTU/pound or greater solid wastes in combination with other liquid waste fuels and coal as fuel.
0198-014	A Section (5) permit issued on January 13, 1998, to install a syngyp process to manufacture synthetic gypsum and mix it with cement kiln dust
122001-014	A Section (5) permit issued on December 21, 2001, to utilize a mixture of waste materials to create an artificial soil to support the production of trees as a renewable alternative fuel source.
092002-022	A Section (5) permit issued on October 2, 2002, for the replacement of the existing kiln system with a new kiln. This new kiln was never built. This project is replacing the original proposal.
1086-004D	An amendment to Permit No. 1086-004 issued on August 6, 2003, to allow alternate feed rate limits based on future compliance testing

PROJECT DESCRIPTION

Continental is proposing to replace its existing wet kiln system with a new 3,300 ton of clinker per day PH/PC kiln system. Additionally, Continental will be excavating a new underground Kimmswick limestone mine 350 feet below grade. According to the installation, the mine can provide over 300 years of limestone reserves to Continental. Until the mine is completed, Continental will purchase and operate an existing

limestone quarry located just south of Saverton. A new shale quarry, a raw material storage and conveying system, dry process milling, conversion of the existing wet raw mill to a finish mill, a coal/petroleum coke feed system and additional alternative fuel storage and feed systems are planned.

Many processes will be removed. The above ground limestone quarries will no longer be operational since the new kiln system is intended to utilize Kimmswick limestone only. The secondary crushing system, slurry storage tanks and existing clinker cooler are all slated for decommissioning, in addition to the wet process kiln, its stack and its electrostatic precipitator. The following discussion provides a description of the changes to be made to the existing plant configuration.

- Raw Material Acquisition
  Until the underground mine is completed, Continental will obtain the majority of its Kimmswick limestone from the existing Saverton Quarry. Limestone is drilled (EP-1) and blasted (EP-2), unloaded at a hopper (EP-4), and then the fragmented stone is crushed to specifications by two crushers in series. The crushed stone is then conveyed (EP-9 and EP-7A) to surge piles and silos (EP-7B) until it is loaded on to trucks (EP-8) for shipment to the Continental plant. When delivered to the main plant, the limestone will be unloaded to a hopper, then conveyed to the limestone storage dome, to await further processing.

  PM_{10} emissions will be controlled from the crushers (EP-6 and EP-6A) and conveyor screeners (EP-5 and EP-5A) at the Saverton Quarry by venting to a baghouse. The vehicular activity areas of the surge piles (EP-30) will either be watered or have chemical suppressant applied to achieve 90% control of emissions. The paved haul road (EP-21) on site will periodically be washed to achieve a 95% reduction in emissions. Although unmodified, special conditions are included in this permit specifying the controls to be used on the road and surge piles since the existing special conditions are being superseded with this permit. The temporary limestone haul road (LS-1) at the Continental plant will be paved and washed, while both the limestone hopper (LS-3) and the limestone storage dome (LS-5) will be vented to baghouses.

  Upon completion of the underground mine, Continental will drill and blast underground onsite (LS-8). Trucks (LS-9, LS-11) will transport the fragmented stone to a crusher/conveying process within the mine. After the stone has been crushed to a 4-inch minus size, it will be conveyed to the limestone storage dome, located on the surface. The crusher (LS-12) and conveyor (LS-13) will both be vented to a baghouse. The haul road in the mine (LS-10) is expected to be wet due to the inherent moisture in the mine, while emissions from the remaining equipment are expected to be reduced due to the mine's underground location.

  A new shale quarry is also planned for the site. Shale, like limestone is mined by drilling and blasting (RM-28 and RM-28A). These are uncontrolled processes. After the blasted rock is loaded onto trucks (RM-29), it is taken to the crusher building for processing, then conveyed to the raw materials storage building. The shale quarry haul road (RM-30) will either be watered or chemical dust suppressant will be

applied. The raw materials storage building is enclosed and vented to baghouses (RM-25 through RM-27). The crusher building is enclosed and also vented to a baghouses (RM-9 through RM-10.2). The conveyor transporting material from the crusher building to the raw materials storage building is also vented to a baghouse (RM-31).

Both clay and iron ore will be hauled in from offsite sources (RM-20A, RM-20B, RM-23 and RM-24). The clay will be unloaded in the clay storage cave (RM-21) or the outdoor clay storage pile (RM-22), and then hauled to the crusher building. Like shale, after crushing, the clay is conveyed to the raw materials storage building. Ash, or other clay substitute may be used. When this occurs, the substituted material will only be stored in the clay storage cave. Iron ore is brought directly to the raw materials storage building, as there is no need to crush the ore. All of these materials are stored in the enclosed raw materials storage building and vented to baghouse.

From the raw materials storage building, each material will be conveyed to storage silos, and then conveyed to the raw mill system. Each conveyor and silo will be vented to a baghouse (RM-31A through RM-34).

- Raw Material Grinding
  A new grinding system will be installed. A roller mill works to grind the raw materials to a uniform size. The raw meal is then dried in the roller mill with hot air from the kiln's preheater induced draft fan exhaust, blended and then conveyed to storage in the raw meal blending silos. From the silos, the raw meal is conveyed to the raw meal feed bin, where it will be fed into the new PH/PC kiln system. All emission points are vented to baghouses (RM-35 through RM-42).

- Fuels and Fuel Handling
  Continental intends to combust a variety of fuels, including coal, petroleum coke (pet coke), solid hazardous waste derived fuel, liquid hazardous waste derived fuel, non-hazardous waste materials, synthetic gas and natural gas. All of these fuels have been used successfully in the existing kiln. New storage tanks will be installed for liquid alternative fuels and a new solids storage building will be constructed for solid alternative fuels.

  - Coal/Pet Coke
    Coal and coke will arrive at the site by barge or rail (CG-1A and CG-1B) or truck and hauled (CG-2A and CG-2B) to storage piles (CG-17). Unloading from the piles will occur by front-end loader. The loader will dump the coal/pet coke into a coal hopper (CG-21), where it will be transferred to the coal feed bin (CG-22). The coal/pet coke will be ground in the coal mill (CG-23) and then stored in the fine coal/coke silos (CG-24 and CG-24A) until fed into the new kiln system. The coal hopper, coal feed bin, coal mill and fine coal/coke silos are all vented to baghouses.

    The coal/pet coke is dried while being ground. The heat for the drying will be provided by exhaust from the kiln and supplemented by a fuel oil fired air heater

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(CG-25). The air heater will be able to combust either diesel fuel or used oil. The coal mill preheater is equipped with low-NO_x burners to reduce NO_x emissions. The new kiln system is more efficient than the wet process kiln. The new kiln system needs only 3.0 MMBTU/ton clinker of energy, compared to 6 MMBTU/ton clinker for the existing kiln. Therefore, Continental's coal use is not expected to increase as a result of this project. The exhaust from the coal mill will be released through the main stack to the ambient air.

- Solid Hazardous Waste Derived Fuel (SHWDF)
  SHWDF will be received and processed in the existing enclosed facility. After processing, the SHWDF will be hauled to the new SHWDF storage building and unloaded to the new SHWDF storage pile (SF-61). From the building, the fuel will be conveyed to the new kiln system. Building emissions will be vented to the new kiln system through the clinker cooler or to carbon filters.

- Liquid Hazardous Waste Derived Fuel (LHWDF)
  Existing tanks will be used to receive LHWDF. LHWDF will be pumped from those tanks to two new burn tanks (SF-3C and SF-3D), and then delivered via piping and pumps to the new kiln system. The new tanks will be vented to carbon filters and a vapor recovery unit. Unloaded tanker trucks and railcars may be cleaned after emptying. Volatile organic compounds (VOCs) associated with the cleaning process are either vented to a flare for combustion or to carbon filters.

- Natural Gas
  Natural gas is to be used for startup only.

- Fuel Oil
  Fuel oil is to be used for the coal mill preheater only. The fuel oil may be petroleum diesel, biodiesel or waste oils meeting the definition found at 40 CFR 279; these are low chlorine, low metals oils.

- Other Fuels
  To supplement SHWDF usage, Continental intends to combust non-hazardous alternate fuels, including chipped tires, shredded plastics, plastic-backed paper, autoplant sludge, automobile fluff, wastewater sludges, industrial resins, furniture manufacturing sawdust and wood waste, plastic and starch abrasives, shredded shingles, wood waste, tank bottoms, spent carbon, off-spec industrial products, mixed industrial debris and other residential residues. Synthetic gas is an additional alternative. All material will be processed in the supplemental fuels system equipment.

  Whenever a fuel other than coal and pet coke are utilized, Continental plans to feed each of the fuels in accordance with the Hazardous Waste Combustor MACT. By so doing, potential emissions of heavy metals, dioxins, furans and other HAPs should be below regulatory thresholds. Although emissions of PM_{10}, SO_x, NO_X, VOC and CO may differ from what is expected from combusting coal and petroleum coke, review of these pollutants would remain the same. The

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method of operation of all control equipment at the installation shall remain constant, regardless of what type of fuel is combusted.

- PH/PC Kiln System
  The system (KP-8) consists of the preheater, precalciner, rotary kiln and cooler. Raw meal is fed to the 4-stage preheater whereupon it is heated to a temperature that allows calcination of the meal in the precalciner. Staged combustion of coal, SHWDF and LHWDF occurs in the bottom of the precalciner. The heated air generated from the combustion of the fuel is the air used in the preheater. The preheater exhaust is routed through the raw mill bypass lime spray dryer (LSD) system when the raw mill is not operating. The LSD will be located prior to the preheater induced draft fan. As mentioned previously, when the raw mill is in operation, the preheater exhaust will be vented directly to the raw mill. Under both operating scenarios, the preheater exhaust is routed through the kiln/mill baghouses that vent to the ambient air through the main new kiln system stack.

  By the time the meal reaches the rotary kiln, calcination is almost complete and the sintering step begins. The main kiln burner will utilize LHWDF, coal or pet coke for fuel. An alkali bypass system (KP-10) will be installed to which 35% of the new kiln system exhaust may be fed. This bypass will allow removal of alkali salts that can cause operational problems from the system. The bypass gases are fed through a LSD and then vented through a baghouse to the main new kiln system stack.

  A new clinker cooler will be installed where air is used to cool the clinker exiting the new kiln system. Some of the air fed to the clinker cooler will be drawn from the SHWDF buildings. Exhaust air from the first four stages of the clinker cooler is used as secondary air for the kiln burner. The remaining exhaust from the clinker cooler is exhausted to an air-to air heat exchanger to lower the air temperature, then to a baghouse that vents to the clinker cooler stack (CM-17). A roll crusher follows the last section of the cooler.

  Reducing atmospheres are created through staged combustion in the low-NO_x section of the precalciner, limiting NO_x production. Natural scrubbing of SO_2 occurs in the rotary kiln, preheater and raw mill systems, in addition to the raw mill bypass LSD that will be installed at the preheater exhaust. Another LSD will control SO_2 emissions from the alkali bypass. High kiln system temperatures and the specific design of the new kiln system control both CO and VOC emissions. Baghouses on each emission point control PM_{10} emissions.

- Clinker Handling and Finish Grinding
  Clinker will be conveyed from the clinker cooler to existing clinker silos, outdoor storage piles, or to stockhouse number 5 through a series of conveyors and belt tripper systems. Existing raw materials silos (RM-14, RM-14A and RM-14B) will be converted to store clinker (CM-08). A number of new baghouses are being installed to control emissions from various points during processing (CM-18 through CM-21B).

  The two existing cement mills will remain unchanged, but the existing raw mill (RM-

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17) will be converted to a third cement mill. The new mill will include a ball mill and air separator. Baghouses will be installed on both the mill and the air separator (CM-22 and CM23).

The existing cement loadout system will remain unchanged with the exception of pneumatic pumping installed between the modified raw mill and existing cement silos. Cement will be loaded onto barges, railcars and trucks. All transfer points will continue to be controlled by baghouses.

- Syngyp Handling
  The synthetic gypsum process is not expected to change from its current configuration. Continental will no longer utilize natural gypsum to the extent it does currently. Any natural gypsum processing that occurs upon completion of this project will be done with the existing syngyp equipment. Some emission point numbering was previously duplicated. The following table provides a list of emission point ID numbers that have been eliminated due to duplication.

  Table 2: Deleted Emission Points

Deleted Emission Point ID	Emission Point Description	Remaining Emission Point ID
SG-01	CKD Screw Conveyor	SG-13
SG-02	Syngyp Outdoor Storage Pile	CG-19
SG-03	Indoor Syngyp storage pile	SG-04

- Emergency Generator
  An 8 MMBTU per hour emergency generator will be installed at the plant. Continental intends to utilize ultra-low sulfur diesel containing no more than 15 ppmw of sulfur in the generator. Continental will not operate the emergency generator for more than 500 hours per year.

NET EMISSIONS INCREASE ANALYSIS

Continental requested to conduct a net emissions increase analysis for NO_X in their permit application. A net emissions increase analysis examines all the emission increases and decreases that have occurred at the installation for the air pollutants of concern during a contemporaneous time period. The amount of these emission increases and decreases are determined by finding the actual emissions (average of a representative two-year period), if available. Typically, if there are not two (2) years of actual emissions data for an emissions unit, the potential emissions for the unit are used instead. In this instance, actual emissions data were taken from the 2004 and 2005 Emissions Inventory Questionnaire (EIQ) submittals.

After the netting analysis has determined the amount of actual or potential emissions for all of the units where increases and decreases have occurred, or will occur during this period, the increases are added together and the decreases are subtracted from this total. If the resulting level of emissions from the netting analysis is below the significant level for that air pollutant, then the project is evaluated as a de minimis

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review instead of a Prevention of Significant Deterioration (PSD) review.

The contemporaneous period is defined as the previous five (5) year period from the date the construction on the project begins (i.e. permit issued) through the date the new equipment actually starts operations. For the netting analysis for this project, the date to begin construction (i.e. permit issued) was estimated to be by June 1, 2006. The new PH/PC kiln system is expected to begin operation by May 2008. Therefore, the contemporaneous period for this netting review was determined to be from June 2001 through May 2008.

A review of the permitting projects during the contemporaneous period at this installation did not identify any projects incurring NO_X emissions increases or decreases. Removal of the existing kiln (KP-01) as part of this project accounts for the sole decrease in NO_X emissions during the contemporaneous period. Increases come from the new kiln system (KP-08) and from the combustion of diesel fuel in the coal mill preheater (CG-25). The NO_X emissions increase analysis yielded a decrease in emissions of 492.62 tons per year, causing this project to be reviewed in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* for NO_X. The results of this net emission increase analysis for NO_X are provided below.

Table 3: Summary of NO_X Netting Analysis

Emissions Unit	Emissions Unit Description	Emission Increase or Decrease	PTE/2-Year Average Actual NO_X Emissions (tons/year)*
Estimated Increase in PM_{10} Emissions From New Project			
KP-08	New Kiln System/Coal Mill Preheater	Increase	1626.08
MS-7	Emergency Generator	Increase	3.50
Actual NO_X Emissions From Existing Equipment Proposed to Be Removed as a Result of Project (2 Year Average)			
KP-01	Kiln	Decrease	-2122.20
Total NO_x Emissions Remaining for Project After Completion of Netting Analysis:			**-492.62**

*PTE = Potential to Emit

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies for calculation of PM_{10} emissions used in this analysis were obtained from the following sections of the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition:

- Section 1.3 *Fuel Oil Combustion* (9/1998),
- Section 11.6 *Portland Cement Manufacturing* (1/1995),
- Section 11.12 *Concrete Batching* (10/2001),
- Section 11.19.2 *Crushed Stone Processing and Pulverized Mineral Processing* (8/2004),
- Section 13.2.2 *Unpaved Roads* (12/2003), and

- Section 13.2.4 *Aggregate Handling and Storage Piles* (1/1995).

Emission factors for potential PM_{10} emissions calculations were also taken from the Factor Information Retrieval (FIRE) Data System for the following SCC numbers:

- 3-05-009-04 Shale/Clay Crushing,
- 3-05-006-14 Clinker Cooler, uncontrolled,
- 3-05-011-08 Concrete Batching, Weigh Hopper Loading: Cement.

Emission factors for non-PM_{10} emissions from the coal preheater fuel oil combustion were taken from the AP-42 section for fuel oil combustion. Potential emissions of HAPs from the new kiln system were based on the emission factors found in the AP-42 section for Portland cement manufacturing. All other non-PM_{10} emissions from the new kiln system were estimated from the BACT limits proposed by the applicant. Finally, VOC emissions from the burn tanks were estimated using the EPA's TANKS 4.0 program.

Potential emissions of the application represent the potential of the new equipment, assuming continuous operation (8760 hours per year). The emergency generator emissions were calculated based on 500 hours of operation annually. Existing potential emissions from the installation are major for all criteria pollutants. Actual emissions were taken from the installation's 2005 EIQ submittal. The following table provides an emissions summary for this project.

Table 4: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Existing Actual Emissions (2005 EIQ)	Potential Emissions of the Application
PM_{10}	15.0	Major	174.51	496.31
SOx	40.0	Major	422.08	1162.35
NOx	40.0	Major	2071.47	1629.58
VOC	40.0	Major	11.54	72.59
CO	100.0	Major	23.32	2168.62
HAPs	10.0/25.0	Major	N/D	96.704
Lead	0.6	N/D	N/D	0.045
Mercury	0.1	N/D	N/D	0.014
Beryllium	4E-4	N/D	N/D	3.97E-4
Fluorides	3.0	N/D	N/D	0.542
Arsenic	10.0	N/D	N/D	0.007
Hydrogen Chloride	10.0	N/D	N/D	84.315
Selenium	10.0	N/D	N/D	0.120

* N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (8) of Missouri State Rule

10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM_{10}, SO_x, VOC and CO are above their respective major source thresholds.

APPLICABLE REQUIREMENTS

Continental shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information,* 10 CSR 10-6.110
  The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.

- *Operating Permits*, 10 CSR 10-6.065

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220

- *Restriction of Emission of Odors*, 10 CSR 10-3.090

SPECIFIC REQUIREMENTS

- *Control of NO_X Emissions From Portland Cement Kilns*, 10 CSR 10-6.380

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *NSPS for Coal Preparation Plants*, 40 CFR Part 60, Subpart Y

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *NSPS for Nonmetallic Mineral Processing Plants*, 40 CFR Part 60, Subpart OOO

- *Emission Standards for Hazardous Air Pollutants,* 10 CSR 10-6.080 – *National Emission Standards for Hazardous Air Pollutants (NESHAPs) for Benzene Waste Operations,* 40 CFR Part 61, Subpart FF

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- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Ethylene Manufacturing Process Units: Heat Exchange Systems and Waste Operations,* 40 CFR Part 63, Subpart XX

- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors,* 40 CFR Part 63, Subpart EEE

- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry,* 40 CFR Part 63, Subpart LLL

- *Restriction of Emission of Sulfur Compounds*, 10 CSR 10-6.260

BACT ANALYSIS

Introduction

Any source subject to Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, Section (8) must conduct a BACT analysis on any pollutant emitted in greater than de minimis levels. The BACT requirement is detailed in Section 165(a)(4) of the Clean Air Act, at 40 CFR 52.21 and 10 CSR 10-0.60(8)(B).

A BACT analysis is done on a case by case basis and is performed in general by using a "top-down" method. The following steps detail the top-down approach:

1. Identify all potential control technologies – must be a comprehensive list, it may include technology employed outside the United States and must include the Lowest Achievable Emission Rate (LAER) determinations.
2. Eliminate technically infeasible options – must be well documented and must preclude the successful use of the control option.
3. Rank remaining control technologies – based on control effectiveness, expected emission rate, expected emission reduction, energy impacts, environmental impacts, and economic impacts.
4. Evaluate the most effective controls – based on a case-by-case consideration of energy, environmental, and economic impacts.
5. Select BACT.

The new PH/PC kiln system, new underground mine and associated processes being permitted by Continental are subject to BACT analysis for PM_{10}, SO_2, CO and VOC emissions, since the significance thresholds (15 tpy, 40 tpy, 100 tpy and 40 tpy, respectively) for each are exceeded. Continental prepared a BACT analysis based on a review of the U.S. EPA RACT/BACT/LAER Clearinghouse (RBLC) database, as well as state and regional BACT/LAER clearinghouses; EPA's Clean Air Technology Center; EPA's New Source Review Guidance Notebooks and Workshop Manual (1990); journal articles and vendor information, and the Portland Cement Association. The BACT analysis is summarized below.

Particulate Matter Less Than 10 Microns in Diameter (PM_{10})

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PM_{10} is emitted from all of the operations at cement plants including material transfer and storage, grinding, classifying systems, crushing, and blending, pyroprocessing, finish grinding, and loading. Since Continental is a named source, BACT review of fugitive emission sources is required. The fugitive sources among these are the temporary limestone and shale haul roads, underground limestone quarrying, shale quarrying and the storage piles for various materials, including limestone, clay, shale, iron ore and solid hazardous waste derived fuel. Although some of the roads will incur increased utilization, no modification of the road is planned; therefore, these roads are not subject to BACT analysis. Likewise, existing storage piles that have had no physical modification did not undergo BACT review. Emissions from these sources were however, included in the PSD determination.

Fugitive Emission Source Control Technologies

- Water Spray and Paving
- Surfactant Spray
- Water Spray
- Paving
- Enclosures

Eliminate the Technically Infeasible Options

Water spray and paving provides the highest level of control (95 percent) of PM_{10} emissions. However, paving of quarry roads or storage piles is considered to be technically infeasible since the trucks used in the quarry operations will exceed the legal weight limits for traditional roads. Quarry roads (and stockpile areas) would need to be specially designed to accommodate the immense load. Additionally, roads associated with the quarry operation change over time as the mining location progresses and/or changes. For these reasons, paving is infeasible. Paving of the roads providing access to the plant is feasible, since the trucks traveling on those roads will not exceed weight limitations.

Surfactant application is technically feasible on storage piles. However, continued use of surfactants can negatively affect final product quality. Use of surfactants on quarry roads, however, is technically feasible and can reduce PM_{10} emissions by 90 percent. An alternative to chemical surfactant use is watering of haul roads; water spray can achieve the same level of control as surfactant if applied in sufficient quantities. Water spray use for stockpile vehicular activity areas is a feasible option.

Use of enclosures for storage piles is effective and feasible. In fact, full enclosure of storage piles is considered to be the most effective method of reducing PM_{10} from storage piles. Enclosure of haul roads is infeasible, due to their length and the complexity of erecting enclosures.

Ranking of Remaining Control Technologies

Table 5: Ranking of PM_{10} Control Technologies by Effectiveness

Control Technology	PM_{10} Control Efficiency	Haul Roads	Stockpiles

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Water Spray/Paving	95%	X	N/A
Surfactant Spray	90%	X	For vehicular activity areas only
Water Spray	90%	X	For vehicular activity areas only
Paving	90%	X	N/A
Enclosures	Varies	N/A	X

*X = applicable, N/A = not applicable.

Watering of material stored in storage piles may result in detrimental secondary environmental effects due to the increased moisture content of the material. Increased fuel usage would result from the need to dry materials prior to their processing. The increase in fuel usage would translate into an increase in PM_{10}, NO_X and CO emissions. The elevated moisture content levels could also negatively affect baghouse control efficiency. For these reasons, water spray of material stored in storage piles is eliminated due to energy, environmental or economic reasons.

Selection of BACT for Fugitive PM_{10} Sources

The following controls are BACT for fugitive sources of PM_{10}:

- Surfactant spray used in accordance with the manufacturer's specifications and/or periodic water spray to achieve a control efficiency of 90% on the shale haul road (RM-30).
- The temporary limestone haul road (LS-1) at Continental's site will be paved. Dust will be removed from the paving periodically through water spray.
- The limestone storage dome (LS-5) and the raw material stockpiles (RM-25, RM-26, RM-27) will be enclosed, held under negative pressure and vented to baghouses. All material but iron ore being transferred into the raw materials storage building will be by conveyor. Enclosure doors will be closed while iron ore trucks are being unloaded.
- The SHWDF storage pile will be enclosed in the kiln burner building (BB-1). This building will be operated under negative pressure and vented to the new kiln system.
- The underground limestone haul road (LS-10) is permanently wet due to cave moisture. Likewise, emissions from the underground limestone quarry and associated truck loading/unloading are inherently controlled by its location (LS-8, LS-9 and LS-11). No additional controls are required for BACT.
- The shale quarrying operations, blasting and truck loading, are uncontrolled. None of the reviewed control technologies are suitable for these operations. Drilling will be either wet drilling or controlled by a dust collector (RM-28, RM-28A and RM-29).

Point source emissions from the plant come from conveyors, crushers and screens used in the quarrying processes; unloading, conveying and crushing associated with raw material handling; process emissions from the new kiln system and raw mill, clinker and additives transfer, finish milling and product loadout. The PM_{10} contributions from combustible sources at the plant, which include the new kiln system, coal mill preheater

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and standby generator, include a condensable fraction, in addition to the filterable portion. All combustible PM_{10} emissions will vent through the plant's main stack, except for the generator.

Point Source Control Technologies

- Fabric Filter Systems
- Electrostatic Precipitator Systems
- Wet Scrubbing Systems
- Inertial Collection Systems
- Inherent Moisture Content/Wet Suppression
- Enclosures

Eliminate the Technically Infeasible Options

Fabric filters are feasible for both the combustion sources and all other point sources at the plant. Electrostatic Precipitator Systems are used most often for continuous combustion sources. Use on an intermittent basis decreases the collection efficiency substantially. Therefore, use of the technology is well suited for the new kiln system only; all of the other point sources will be operating on an intermittent basis. Wet scrubbing systems are infeasible for the new kiln system since introduction of water into the exhaust results in the formation of hydrated cement. Wet scrubbers are infeasible for other point source operations because of their intermittent operation. Although inertial collection systems (cyclones) are a proven technology, they are most effective for larger particles; baghouse control is more efficient.

Ranking of Remaining Control Technologies

Table 6: Ranking of PM_{10} Control Technologies by Effectiveness

Control Technology	PM_{10} Control Efficiency
Fabric Filters	95-99+%
Electrostatic Precipitator Systems	80-98%
Wet Scrubbing Systems	90%
Inertial Collection Systems	10-90%
High Moisture Content/Wet Suppression	75-96.6%
Enclosures	Varies

Baghouse control is the top option. Continental had originally proposed achieving an outlet grain loading of 0.01 grains per dry standard cubic foot (gr/dscf) for all emission points controlled by baghouses for BACT. This level was higher than that found in the majority of recently issued permits across the nation, so a more thorough justification of the 0.01 gr/dscf number was requested.

One point in particular was investigated. Continental, along with the Cement Kiln Recycling Coalition and Ash Grove Cement Company had filed a petition for reconsideration of the final NESHAP for hazardous waste combustors (HWC) that was recently promulgated in October 2005. The final rule had established a floor for new cement kilns used as HWCs of 0.0023 gr/dscf. The petition requested that the floor be adjusted upwards to 0.0069 gr/dscf. The Air Pollution Control Program questioned

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Continental's ability to meet the particulate matter standard when burning hazardous waste, but not when burning coal, pet coke, or other alternative fuels and Continental's submittal of a BACT limit higher than an applicable MACT limit.

Continental submitted an addendum to their PM_{10} BACT analysis to the Air Pollution Control Program (amendment #1, submitted March 21, 2006 and revised March 22, 2006) with revised baghouse outlet grain loading. Baghouse outlet grain loading limits were investigated for each type of emission point, taking into account characteristics of the bags available and operating conditions for each of the flows. The revised grain loading numbers are as follows:

- Main new PH/PC kiln system and alkali bypass baghouses – 0.0069 gr/dscf
- Clinker cooler baghouse – 0.01 gr/dscf
- All other baghouses – 0.01 gr/dscf

The Air Pollution Control Program is satisfied with the justification provided in Continental's BACT analysis for the use of the revised grain loading numbers cited for all combustion sources and the clinker cooler. The outlet grain loading for the main new kiln system and alkali bypass baghouses, which both vent through the main new kiln process stack, are at the same level as in the proposed MACT rule currently published in the Federal Register that is open for comment. Use of the outlet grain loading limit, combined with a pound of PM_{10} per ton of clinker number (to be discussed later) will serve as BACT. An investigation into recently permitted plants throughout the country showed that these outlet grain loading values satisfy requirements of state BACT reviews.

With the BACT analysis revision, Continental did not amend the outlet grain loading number for its other sources, however. Several recently issued permits have BACT limits for non-pyroprocessing sources lower than 0.01 gr/dscf. Among these are two plants in Florida with lower numbers for raw material and clinker handling: the Sumter Cement permit (issued February 6, 2006) has a limit of 0.0085 gr/dscf; the American Cement permit (issued February 13, 2006) has a baghouse outlet grain loading limit of 0.007 gr/dscf. The Air Pollution Control Program requested Continental to address those lower limits in their analysis.

In response, Continental provided an incremental cost analysis as part of their revised BACT analysis to show that use of higher quality bags for nuisance sources are economically infeasible for the installation. However, the cost analysis showed the only cost associated with the higher efficiency bags was the cost of the bags themselves. The Air Pollution Control Program assumes that the increased cost of the bags is a cost shared by all plants required to meet BACT limits, and therefore, elimination of the higher quality bags due to their cost is not justifiable. Per subsequent meetings (March 31, 2006) with Continental representatives, the installation has agreed to use of higher quality bags for raw material and clinker handling baghouses, limiting outlet grain loading to 0.007 gr/dscf (amendment #2, submitted April 3, 2006).

As mentioned previously, combustible sources generate condensable PM_{10} emissions, in addition to filterable PM_{10}. Difficulty was encountered in developing a pound of total PM_{10} per ton of clinker BACT emission limit due to that condensable fraction. The

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recommended method for testing condensable PM_{10} is EPA's Method 202. Continental argues that Method 202 overestimates condensable PM_{10} due to artifact condensable particulate matter caused by catalytic and aqueous phase reactions of SO2 in the sampling train. The test includes the artifact formation, although this amount would not actually become condensable PM_{10} in the ambient air. Several papers were included in the revised BACT analysis supporting this assertion. Since the Kimmswick limestone that will be used is quite high in pyritic sulfur, Continental is concerned that the artifact formation will be significant.

The Air Pollution Control Program accepts that levels of SO2 in the sampling train may affect test results from Method 202 testing. EPA also agrees and suggests optional procedures should be specified to account for particular flue gas characteristics. Of particular importance in this instance, use of a nitrogen purge (rather than air) immediately following sampling and for the recommended one hour should reduce the conversion of SO2 to SO3, and eventually H2SO4. Additional procedures are included in EPA's website. Exact testing procedures will be decided by the Air Pollution Control Program's Compliance Section prior to actual testing and should account for the great variation that is possible.

Although Continental contends that artifact formation of condensable PM_{10} would occur, determining the extent of that formation is not a simple matter. Comparison with other plants across the country using Method 202 tests is also made difficult by the many different options that can be used while performing the tests. In addition to the potential artifact formation, individual plant operating parameters and raw materials affect the quantity of condensable particulate matter. Continental believes, and the Air Pollution Control Program concurs, that given the limitations described above, the most reasonable method to determine a BACT limit for condensable PM_{10} is by comparison with other plants similar to the proposed plant and utilizing similar raw materials.

Continental has determined in their revised BACT analysis that the limestone most likely used at the Lehigh plant in Mason City, Iowa, has similar SO3 content as the Kimmswick limestone proposed for the new plant. The plant size and process design are also similar to the Iowa plant. The Lehigh plant has a total PM_{10} limit of 0.516 pounds per ton (lb/ton) of clinker. The LaFarge plant in Iowa also has this limit. Review of other plants with recent BACT limits for total PM_{10} include the Holcim plant located in Ste. Genevieve, Missouri. The Holcim plant has a limit of 0.28 pounds PM_{10} per ton of clinker; however, the plant also utilizes limestone with much lower pyritic sulfur content. A draft permit for a kiln in Arizona that was under public notice during this review had a proposed BACT limit of 0.072 lb/ton. Continental believes that this emission rate is unattainable for the filterable portion alone, let alone the total PM_{10}; the Air Pollution Control Program concurs. Finally, the Roanoke Cement plant in Virginia was explored. The most recent PM_{10} limit for the facility has actually changed to 0.255 lb/ton of kiln feed as of January 2006 with the issuance of a new permit that superseded a PSD permit issued in 2003. Due to its production of lime, rather than cement, and the basis of its BACT limit being on a ton of kiln feed basis rather than on a ton of clinker basis, its BACT limit was not considered further.

Selection of BACT for Point Source PM_{10} Emissions

Baghouses have been selected as BACT for each point source of PM_{10} emissions that is new or modified. This is the top control method. Table A.1 of the appendix lists the emission points vented to baghouse and the associated outlet grain loading for each baghouse. Emissions from the main stack will be limited to 0.516 pounds of total PM_{10} per ton of clinker. This is the limit selected as BACT for the similar plant in Iowa.

PM_{10} Control Technologies for Emergency Generator
- Particulate Traps
- Oxidation Catalyst

Energy, Environmental, and Economic Impacts
Both control technologies are technically feasible. An economic analysis was conducted for the two add-on control options and costs were greater than $100,000 per ton of PM_{10} removed, based on 500 hours of operation. Therefore, both particulate traps and oxidation catalyst are eliminated due to economic feasibility.

Selection of BACT for Emergency Generator
No control will be required for BACT for the emergency generator for PM_{10}.

Sulfur Oxides (SO_x)
SO_x emissions are expected from the new kiln system, combustion of fuel in the coal mill air preheater and from combustion of fuel in the emergency generator.

SO_x Control Technologies for Kiln System/Coal Mill Preheater
- Wet Lime Scrubbing
- Inherent Raw Mill Dry Scrubbing
- Lime Spray Drying
- Dry Lime Scrubbing

Eliminate the Technically Infeasible Options
Wet lime scrubbing (WLS) is very effective in reducing SO_x emissions. Continental was only able to find WLS systems across the country that have been installed to avoid PSD review for SO_x by netting or as a result of enforcement proceedings and a consent agreement. WLS is technically feasible for the kiln system.

Inherent scrubbing takes place in different portions of the kiln system. The in-line raw mill, although operating at low temperatures, operates at high relative humidity, making it an excellent scrubbing atmosphere. Removal efficiencies from this portion of the kiln can range from 50-70%, and up to 75% when lime is added to the mill. Continental intends to add lime to the raw mill, obtaining a control efficiency of 72%. Inherent scrubbing is considered to be technically feasible for the kiln system.

Lime spray drying (LSD) is technically feasible for the new kiln system (dry lime scrubbing follows the same principles as LSD, but is not nearly as effective, so will not be looked at further). Removal efficiencies of up to 90% are achievable for PH/PC kiln systems using LSD. This removable rate is achievable if the lime injected into the system is very fine, the residence time is sufficient within the LSD and temperatures are

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high, given a particular calcium-to-sulfur ratio. In Continental's case, the kiln outlet temperatures (450° F) are much lower than what is needed to achieve the exceptional level of removal (700°+ F). Due to temperature constraints, the installation does not believe that the removal efficiency from the alkali bypass LSD stream can exceed 67.5%. This level of control is partially dependent upon the installation utilizing a sodium hydroxide solution in the alkali bypass LSD, rather than a lime solution. Although use of sodium hydroxide is possible for the bypass dryer, the raw mill bypass LSD cannot utilize the same material since an increase in alkali materials in the kiln would result. Therefore, the removal rate from that LSD is only 65%.

Due to Continental's exhaustive list of potential fuels for the kiln system, establishment of separate BACT limits for different fuels with varying sulfur contents was considered. Continental contends that any sulfur that is contained in fuel is inherently scrubbed out in the calciner/burning zone section of the kiln system. Two papers were submitted arguing that there is no fuel sulfur contribution. However, the papers state that the lack of fuel sulfur contribution is a hypothesis and no hard evidence was submitted.

Continental did however, discuss the importance of the alkali to sulfur ratio in the kiln. For the kiln system to operate effectively, the sulfur-to-alkali ratio must be between 0.8 and 1.2. Should the ratio fall below 0.8, cement kiln dust must be wasted from the system to prevent quality issues with excess alkalis in the cement. Should the ratio be above 1.2, the sulfur will combine with calcium, become very sticky and plug up the process system. Therefore, since Continental has high levels of pyritic sulfur in the raw materials, fuel with lower sulfur content is needed to keep the ratio within the preferred range. Use of alternative waste fuels with little sulfur content can be combined with higher sulfur coals and pet coke to arrive at an average fuel sulfur content, or when burning no alternative fuels, the sulfur content of the coal/pet coke must be lower. Consideration of a separate BACT for each distinct fuel combination is not needed.

Ranking of Remaining Control Technologies

Table 7: Ranking of SO_x Control Technologies for New Kiln System by Effectiveness

Control Technology	SO_x Control Efficiency*
Wet Lime Scrubbing	80-95%
Inherent Raw Mill Dry Scrubbing	50-75%
Lime Spray Drying	50-90%

*SO_x control efficiencies taken from attachments to *Amendment to the BACT SO_2 Analysis*

Energy, Environmental, and Economic Impacts

Continental provided an economic analysis for the installation of a wet lime scrubber. Since a similar sized unit has been installed at the Lehigh Cement plant in Iowa, costs for several items were utilized from actual costs incurred at that plant. Removal of SO_x using a wet scrubber are over $6,800 per ton, increasing the cost per ton of clinker by over 7%. Use of a wet scrubber is considered to be economically infeasible.

There is a portion of the kiln exhaust that will exit the plant uncontrolled. The portion of the kiln exhaust that is routed to the coal mill when the raw mill bypass LSD is not

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operating (when the raw mill is operating), will be routed to the main kiln stack after the alkali bypass stream LSD. Continental prepared an economic impact analysis for two scenarios: installation of a LSD followed by reheat prior to the coal mill and installation of a wet scrubber for the coal mill exhaust. Both solutions proved to be economically infeasible, costing Continental over $7,300 per ton of SO_x removed for the wet scrubbing system and over $8,200 per ton of SO_x for the reheat option.

Selection of BACT for SO_x Emitting Units
Inherent raw mill scrubbing is considered to be BACT. Installation of a LSD on the alkali bypass stream and another LSD on the raw mill bypass stream are also necessary for BACT. The stream going to the coal mill when the raw mill bypass LSD is not operating will remain uncontrolled. Exhaust streams from the kiln will all combine and exit the plant from the main stack. Emissions from the plant exiting the main stack will be limited to 1.93 pounds of SO_x per ton of clinker.

SO_x Control Technologies for Emergency Generator
- None

Selection of BACT for Emergency Generator
No control will be required for BACT for the emergency generator for SO_x.

Volatile Organic Compounds (VOCs) and Carbon Monoxide (CO)
VOC and CO emissions are emitted from combustion sources at the plant, including the new PH/PC kiln system and the combustion of fuel in the coal mill preheater and emergency generator. Organic compounds found in the raw materials are the primary source of VOC emissions, while CO emissions are caused by incomplete combustion. Continental has chosen to utilize shale and clays that are low in organic carbon content, but the Kimmswick limestone does have a high organic carbon content. Non-combustion sources of VOC emissions include the working and breathing losses from the two new LHWDF burn tanks. The new PH/PC kiln system emissions will be combined with the exhaust gases from the coal mill preheater, so all post-combustion controls discussed will handle both the coal mill preheater and kiln exhausts. Control technologies for VOC and CO are similar, so the BACT analysis for the two pollutants has been combined.

VOC and CO Control Technologies for Kiln System/Coal Mill Preheater
- Thermal Oxidation – Regenerative or Recuperative
- Catalytic Oxidation
- Good Combustion Practices (GCP)

Eliminate the Technically Infeasible Options
Thermal oxidation is used to oxidize pollutants by combustion. As with any pollution control device, removal rate is dependent on the inlet concentration of the pollutant. In Continental's case, the inlet concentration to an oxidation unit would be extremely low (less than 10 parts per million by volume of VOC), so the removal efficiency, which can be over 99.9% at times, is more reasonably expected to be closer to 50%. Since the volume of exhaust gas from the new kiln system is so large, four units operating in parallel would be needed.

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Continental is concerned that operation of a thermal oxidation unit at their installation could result in two consequences. Acid gases from the kiln have the potential to cause corrosion in the oxidizer. However, if the unit is operated properly, the temperature within the unit will never fall to the acid dew point temperature where condensation, and subsequent corrosion of the equipment, would occur. Continental believes a second potential problem is the possible formation of a detached visible plume caused by the oxidation of SO_2 in a thermal oxidizer. Continental believes that installation of a wet lime scrubber (WLS) following the oxidizer would be necessary to avoid a plume and thus BACT should include the WLS in the analysis. The cost of the WLS cannot be included since only "non-air" environmental impacts can be included in a BACT analysis. Thermal oxidation, including both regenerative thermal oxidation (RTO) and recuperative thermal oxidation, are considered to be technically feasible for the removal of VOC and CO.

Another option is the use of catalytic oxidation for the removal of CO/VOC. Rapid deactivation of the platinum/rhodium-based catalyst is a great concern due to the particulate loading on the oxidizer for cement kilns. Decreased heat recovery is expected from the any type of oxidation unit due to dust loading greater than for other industries. Rather than achieving up to 95% heat recovery that is typical in other industries, the cement kiln operations will achieve a heat recovery of only 70%. Continental does not believe that performance could meet the specifications. Catalytic oxidation is considered to be technically infeasible.

Good combustion practices (GCP) are commonly utilized at every installation; operation using GCP is considered to be technically feasible. GCP is expected for both the coal mill preheater and at the new PH/PC kiln system.

Table 8: Ranking of VOC and CO Control Technologies by Effectiveness

Control Technology	VOC Control Efficiency	CO Control Efficiency
Thermal Oxidation Units	50-99.9%	90%
Good Combustion Practices	Varies	Varies

Energy, Environmental, and Economic Impacts
As stated previously, the cost of the addition of a WLS was not considered. The costs associated with the installation and operation of the oxidation unit, however, were reviewed.

An economic analysis was completed to compare regenerative thermal oxidation and recuperative thermal oxidation. Fuel costs make both oxidation options economically infeasible, as shown in Continental's economic analysis. The cost of removal using a recuperative thermal oxidizer would exceed $58,000 per ton of VOC and $5,600 per ton of CO. RTO costs are even higher. Oxidation is not economically feasible. This is consistent with BACT determinations around the country.

Selection of BACT for Kiln System/Coal Mill Preheater
The new PH/PC kiln system and the coal mill preheater will utilize good combustion practices for BACT. The installation will not emit more than 3.6 pounds of CO per ton

of clinker and not more than 0.12 pounds of VOC per ton of clinker from the main stack.

VOC and CO Control Technologies for the Emergency Generator
- Engine Modifications
- Exhaust Oxidation Catalyst
- Proper Maintenance of Unit

Eliminate the Technically Infeasible Options
Continental intends to purchase a packaged unit to meet its emergency electrical generation needs. Modifications to the engine are not deemed to be technically feasible. However, Continental may maintain the unit so that in the case of an emergency, emissions from the unit will be minimal.

Selection of BACT for the Emergency Generator
Proper maintenance of the unit have been chosen for BACT.

VOC and CO Control Technologies for Tanks
- Thermal Oxidation
- Catalytic Oxidation
- Carbon Bed Adsorption
- Flare

Eliminate the Technically Infeasible Options
Oxidation methods of control are not considered to be technically feasible. The tanks are equipped with relief valves for breathing loss emissions that emit the vapors intermittently in "puffs" from the tanks. The oxidation bed would not be able to reach operating temperature before the emission would cease. This intermittent release also makes flares technically infeasible. By the time a flare was ignited and stable, the release of emissions would be over. Carbon bed adsorption is the only technically feasible option.

Selection of BACT for Tanks
Carbon bed adsorption is the only technically feasible method of controlling VOC emissions from the tanks and is chosen as BACT.

AMBIENT AIR QUALITY IMPACT ANALYSIS

An ambient air quality impact analysis (AAQIA) was received with the permit application to determine the ambient impact of PM_{10}, SO_2, CO and HAP emissions at or beyond the property boundary of the Continental plant. The AAQIA must be completed for any air contaminant that exceeds the de minimis emission levels outlined in 10 CSR 10-6.020 (3)(A) Table 1. Additional impacts on visibility, growth, soils, plants and animals were also evaluated within the Class II area surrounding the facility. Refer to the April 20, 2006 memorandum from Dawn Froning to Lina Klein, through Kyra Moore, entitled, "Ambient Air Quality Impact Analysis (AAQIA) for The Continental Cement Company – Prevention of Significant Deterioration (PSD) Modeling – 01/24/06 Submittal".

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Although the original submittal of Continental's AAQIA was received in January 2006, significant revisions in design and emission rates have been made since that time. The most obvious of these changes is the elimination of an independent stack from the coal mill. Staff noted during the review process that the SO_2 impact from this source exceeded the preconstruction monitoring thresholds outlined in 10 CSR 10-6.020 (3)(B) Table 2. Because preconstruction monitoring for SO_2 was not conducted, Continental opted to redesign the plant and vent the coal mill and coal mill preheater emissions through the main stack rather than an independent stack, thereby reducing ambient SO_2 concentrations. Modifications to exit velocities were also made, to account for horizontally venting stacks and those equipped with rain caps.

A preliminary analysis was conducted to determine if Continental would be required to perform preconstruction monitoring, additional air quality modeling, or if Continental could forego further analysis altogether. If the preliminary analysis indicates that the facility will not significantly impact the air quality within a region, no further analysis is required. In addition to providing an indication of what pollutants must undergo a full impact analysis, the results of the preliminary analysis determine what, if any, preconstruction monitoring will be required. If the preliminary analysis indicates that the facility will not exceed the monitoring significance level, no preconstruction monitoring is necessary.

Table 8 summarizes the results of the preliminary analysis. No further modeling or preconstruction monitoring is required for CO based on the results of the preliminary analysis. A full impact analysis is needed for SO_2 and PM_{10}. Additionally, one year of preconstruction monitoring for PM_{10} is required. Continental commenced this monitoring on May 4, 2005.

Table 8: Significance Levels for Modeling and Preconstruction Monitoring ($\mu g/m^3$)

Pollutant	Averaging Period	Modeling Significance Level	Preliminary Analysis Results	Additional Modeling?	Pre-construction Monitoring Required?
CO	1-hour	2000	194.46	No	No
	8-hour	500	58.76		
SO_2	3-hour	25	61.38	Yes	No
	24-hour	5	7.21	Yes	
	Annual	1	0.45	No	
PM_{10}	24-hour	5	34.27	Yes	Yes
	Annual	1	3.44	Yes	

The full impact modeling analysis expands upon the preliminary analysis be requiring the applicant to consider emissions from the proposed source in conjunction with other existing sources, and secondary emissions resulting from residential, commercial and industrial growth due to the new project.

Since Continental exceeded the significance level for SO_2 and PM_{10}, an evaluation of compliance with the National Ambient Air Quality Standards (NAAQS) was required.

This demonstration includes emissions from the proposed source, as well as existing "interactive" sources. Table 9 summarizes the results of the NAAQS compliance demonstration. As shown in the table, the modeling results indicate that violations occurred for SO_2 and PM_{10}. Given the violations, Continental had to show that there was no significant impact from any violating receptor. The far right column of the table indicates that no significant impact occurred for either pollutant.

Table 9: NAAQS Compliance Demonstration Results ($\mu g/m^3$)

Pollutant	Averaging Period	NAAQS	Modeling Results	Significant Impact at Violating Receptor?
SO_2	3-hour	1300	2327.41	No
	24-hour	365	518.35	No
	Annual	80	45.16	N/A
PM_{10}	24-hour	150	9798.69	No
	Annual	50	1050.71	No

Continental was also required to complete an increment analysis to demonstrate that they will not deteriorate the air quality beyond the limits outlined in 10 CSR 10-6.060 (11)(A) Table 1. The analysis for both pollutants included all sources that received a permit since 1977 within 50-kilometers of Continental's significant impact area. Increment analysis also requires that violations of the increment must show no significant impact at any violating receptor. Table 10 summarizes the results of this exercise, showing that although there were violations of the increment, there was no significant impact at any violating receptor. No further analysis is required for either SO_2 or PM_{10}.

Table 10: Increment Analysis Results ($\mu g/m^3$)

Pollutant	Averaging Period	Increment	Modeling Results	Significant Impact at Violating Receptor?
SO_2	3-hour	512	732.07	No
	24-hour	91	137.64	No
	Annual	20	15.99	N/A
PM_{10}	24-hour	30	5706.09	No
	Annual	17	409.23	No

A Risk Assessment Level (RAL) compliance demonstration is required for each hazardous air pollutant (HAP) in question as required by the permit granting authority. The demonstration was conducted for each HAP that exceeded the proposed Section 112(g) de minimis levels and included hydrogen chloride, arsenic, lead, mercury, selenium, benzene and beryllium. None of the HAPs exceed the RALs on either a 24-hour or annual basis, so no further analysis is required. Table 11 summarizes the results from this analysis.

Table 11: HAPs Modeling Results ($\mu g/m^3$)

Air Contaminant	Averaging Period	RAL	Modeling Results	Compliance?

Hydrogen Chloride	24-hour	7	0.782	Yes
	Annual	7	0.064	Yes
Arsenic	24-hour	0.0005	6.70E-05	Yes
	Annual	0.0002	5.48E-06	Yes
Lead	24-hour	0.357	0.00042	Yes
	Annual	0.07	3.43E-05	Yes
Mercury	24-hour	0.14	0.0023	Yes
	Annual	0.07	9.43E-06	Yes
Selenium	24-hour	0.54	0.0011	Yes
	Annual	0.54	9.15E-05	Yes
Benzene	24-hour	1	0.089	Yes
	Annual	0.12	0.007	Yes
Beryllium	24-hour	0.001	3.70E-06	Yes
	Annual	0.0004	3.03E-07	Yes

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

Lina Klein
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated September 29, 2005, received September 29, 2005, designating Continental Cement Company, L.L.C. as the owner and operator of the installation.
- Revised application, dated and received January 24, 2006.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Factor Information Retrieval (FIRE) Data System, Version 6.25.
- Northeast Regional Office Site Survey, dated October 14, 2005.
- Request for Stay of HWC MACT Cement Kiln Particulate Matter Standard for New Sources, Petition for Reconsideration, received January 31, 2006.

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- Amendment to the BACT CO and VOC Analysis, dated March 22, 2006, received March 23, 2006.
- Amendment #2 to the CO and VOC Analysis, dated April 17, 2006 and received April 18, 2006.
- Amendment #3 to the CO and VOC Analysis, dated and received April 23, 2006.
- Generator Information Submittal for CO and VOC Analysis, dated and received April 25, 2006.
- Revised Generator Information Submittal for CO and VOC Analysis, dated April 26, 2006 and received April 27, 2006.
- Amendment #4 to the CO and VOC Analysis, dated and received April 27, 2006.
- Amendment to the BACT PM_{10} Analysis, dated and received March 21, 2006; revised March 22, 2006.
- Response to MDNR PM_{10} BACT Questions, dated March 28, 2006, received March 30, 2006.
- Amendment #2 to the BACT PM_{10} Analysis, dated and received April 3, 2006.
- Amendment to the BACT SO2 Analysis, dated March 22, 2006, received March 23, 2006.
- Amendment #2 to the BACT SO2 Analysis, dated and received April 3, 2006.
- Amendment #3 to the BACT SO2 Analysis, dated and received April 23, 2006.

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Table A.1 Point Source Baghouse Control Devices

Emission Point ID No.	Description	Control Device ID No.	Outlet Grain Loading (gr/dscf)
CG-21	Coal/Coke Hopper	716BF1	0.007
CG-22	Coal/Coke Transfer/Coal/Coke Feedbin	716BF2	0.007
CG-23	Coal/Coke Mill	726BF1	0.0085
CG-24	Fine Coal Silo	746BF1	0.007
CG-24A	Fine Coke Silo	746BF2	0.007
CG-25	Coal Mill Preheater	726BF1	0.007
RM-25, 26, 27	Raw Materials Storage Building	116BF4/ 196BF1	0.007
RM-31	Raw Material Crusher Conveyor Baghouse	116BF2	0.007
RM-31A	Raw Material Conveyor Baghouse	196BF1	0.007
RM-32	Limestone Silo/Shale Silo/Conveyors Baghouse	136BF3	0.007
RM-33	Clay/Iron Ore Silos/Conveyors Baghouse	196BF2	0.007
RM-34	Limestone/Shale/Clay/Ore Conveyor Baghouse	216BF1	0.007
RM-35	Top Elevator/Conveyor Baghouse	216BF2	0.007
RM-36	Bottom Elevator/Conveyor Baghouse	216BF3	0.007
RM-37	Airslide Baghouse	236BF1	0.007
RM-38	Airslide/Elevator Baghouse	236BF2	0.007
RM-39	Silo Vent Baghouse	286BF1	0.007
RM-40	Airslide/Feedbin/Elevator Baghouse	286BF2	0.007
RM-41	Airslide/Elevator Baghouse	286BF3	0.007
RM-42	Airslide/Elevator Baghouse	276BF1	0.007
LS-3	Limestone Truck Hopper	116BF1	0.007
LS-5	Limestone Storage Dome	116BF3	0.007
LS-6	Limestone Dome Conveyor	116BF3/ 136BF3	0.007
LS-12	Underground Quarrying – Limestone Crushing	105BF1	0.007
LS-13	Underground Quarrying – Limestone Conveying	105BF2	0.007
KP-8	Cement Kiln	326BF1	0.0069
KP-2/9	Cement Kiln Dust Loadout Bin	326BF3	0.007
KP-10	Alkali Bypass	326BF1	0.0069
CM-17	Clinker Cooler	356BF1	0.01
CM-18	Clinker Handling	356BF2	0.007
CM-19	Clinker Handling 2	356BF3	0.007
CM-20	Clinker Handling 3	356BF4	0.007
CM-21A	Clinker Silo Vent	356BF5	0.007
CM-21B	Clinker Silo Vent 2	356BF6	0.007
CM-22	Finish Mill – SKS	546BF1	0.007
CM-23	Finish Mill – Mill Vent	546BF2	0.007
SH-02	Cement Storage Silos – Truck Loading	CDC-1 to CDC-6	0.007
EP-05	Conveyor Screener	S05	0.007
EP-06	Crusher	S06	0.007
EP-5A	Conveyor Screening 2	S05A	0.007
EP-6A	Crusher 2	S06A	0.007

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